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Deinstitutionalized patients, homelessness and imprisonment: A systematic review

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Summary

Background: Reports linking psychiatric deinstitutionalization to homelessness and imprisonment have been published widely in scientific literature.

Aims: This review aimed to identify cohort studies which followed up or traced back long-term psychiatric patients who were discharged from psychiatric hospitals as a consequence of deinstitutionalization.

Methods: A broad search strategy was used and 9435 titles and abstracts were screened, 416 full articles reviewed and 171 articles from cohort studies of deinstitutionalized patients were examined in detail.

Results: 23 studies of unique populations assessed homelessness and/or imprisonment among discharged long-term patients. Results demonstrate that homelessness and/or imprisonment occurred sporadically; in the majority of studies there was no single case of homelessness and/or imprisonment reported.

Conclusions: The results of this review are contradictory to the findings of ecological studies which indicated a strong correlation between the decreasing number of psychiatric beds and increasing number of those with mental health problems living in either homelessness or prisons.

Declaration of interest: None

Keywords

Deinstitutionalization, criminal behavior, homelessness, suicide, psychiatric hospital discharge, mental health care reform

Introduction

In 1939, Penrose examined European statistics on prison and psychiatric hospital populations and introduced what is now known as “hydraulic hypothesis”. The hydraulic hypothesis presents the idea that number of prisons increases as the number of psychiatric beds decreases (1-4). This idea gained prominence in the era of deinstitutionalization (3, 5, 6) and has been revisitedfollowing deinstitutionalization in South America (7,8) .

Deinstitutionalization emerged in the 1950s and 1960s in the USA and UK and was triggered by humanitarian, economical and societal factors (9-11). Subsequently, deinstitutionalization was also pursued in Canada (13, 14), Western Europe (15, 16), Northern Europe (17-19), Southern Europe (20, 21), in non-communist Central European countries (22), Australia (23, 24), New Zealand (25), Jamaica (26, 27) and in other parts of the world. In many countries, deinstitutionalization is still an ongoing process (22). However, in Central and Eastern Europe and in East and Southeast Asia mental health care still heavily relies on large psychiatric hospitals and therefore deinstitutionalization is central to mental health reforms in these areas (28, 29).

Since the beginning of deinstitutionalization, the argument that psychiatric reforms have led to deinstitutionalized psychiatric patients entering prisons and becoming homeless have been prolifically published in professional literature (5, 30-33) as well as in regular newspapers (see for

instance the article by Winerip (34)). As a rule, these arguments have been based on either, ecological studies or, more often, on personal observations or judgements. Ecological studies are observational studies which work with aggregated rather than individual data. Such studies resulted in contradictory findings. Hodgins, Muller-Isberner (35), Priebe, Badesconyi (20), Raphael and Stoll (36) and Kramp and Gabrielsen (37), for example, came to the conclusion that where there are fewer psychiatric beds there are more criminal convictions of those with mental disorders. On the other hand, for instance, Hartvig and Kjelsberg (38)) and Wallace, Mullen (33) came to the opposite conclusion and did not attribute increased criminal convictions to deinstitutionalization. No matter what the findings were ecological studies face the risk of ecological fallacy, i.e. invalid inference on causal relationship from group data to individual level.

Limitations of ecological studies might be overcome by cohort studies. Indeed, some cohort studies focus on the relationship between deinstitutionalization and crime and homelessness among discharged patients. Some of those studies approached people who were homeless or in prison and then detected history of psychiatric treatment at the individual level (see for instance Bassuk and Lamb (39) and Whitmer (40)). The problem with such cohort studies is an implicit assumption that these, usually new and acute patients, would not end up homeless or in prison in the old system dominated by psychiatric hospitals. It is an assumption that the old system would deal with the new societal situation somehow better.

, Maj (41) on behalf of WPA and in concordance with WHO (42) and EU (43) stated that deinstitutionalization should be regarded as a priority worldwide. However, the question of homelessness and criminality among deinstitutionalized patients has not been resolved (44), and it may become an obstacle to the reform efforts. For instance, in the Czech Republic some psychiatrists and media outlets published messages predicting that mental health reform will drive psychotic people into homelessness and imprisonment (45-49). This backlash phenomenon has been described during the early years of deinstitutionalization in the USA and it is referred to as anti-deinstitutionalizationism (10).

Cohort studies of discharged patients may help to shed light on whether or not deinstitutionalization has led to homelessness and/or criminality. These could utilize either a follow-up design and assess the patients at the base-line and then repeatedly for a longer period or they could follow a trace back design when the patients who were deinstitutionalized some period ago are re-examined.

It was the aim of this review to identify such cohort studies and assess the homelessness and imprisonment among those with severe mental disorders who were discharged from psychiatric hospitals in the consequence of deinstitutionalization. A further aim was to assess the suicidality among these patients as it was suggested that a reduction in psychiatric beds might also lead to increased suicidality (48, 49). This review was conducted in order to bring new insights into the long-lasting controversy about the association between deinstitutionalization and homelessness and criminality. In other words, we hoped to replace rhetoric with evidence. This should inform decision makers, especially in countries with dominant institutional mental health care and help them to pursue a good strategy for mental health care development. Deinstitutionalization is the official WHO policy for Europe, but if it leads to homelessness and criminality, the price to be paid may be perceived as too high by both policy makers and the public.

Methods

PICOS

A systematic literature review in compliance with PRISMA guidelines was conducted between July 2013 and February 2014. Following the PICOS (Patient, Intervention, Comparison, Outcomes, and Study design), the review was designed as follows:

Patients were defined as those with severe mental disorders who were residents of psychiatric hospitals for more than one year, whose main disability was not related to old age (dementia) or learning disabilities, and were between 18 and 65 years old. If patients were older, the study could still be included if it was made clear that those with dementia were not eligible for the study. Patients with dementia and patients with learning disabilities were excluded because they do not represent typical populations of mental hospitals, rather there were special institutions established for both of these groups. The definition of length of stay was chosen in line with other studies in the field including the study of TAPS team (52) and others (53-55) that defined long-term patient as a patient who was hospitalized for more than one year. However, some studies defined long-term psychiatric patients as those with the length of stay longer than 6 months (56, 57), and yet another studies used minimal periods of up to two years (58).

Intervention was defined as a discharge of patients from psychiatric hospitals which was driven by deinstitutionalization. Deinstitutionalization was defined broadly as a policy of either significant reduction of the number of beds in psychiatric hospitals or total closure of hospitals. The simultaneous development and functioning of community care was not necessary in order for study to be included in final analysis, although this would have had probably influenced the outcomes of interest. Only patients discharged from common as opposed to secure psychiatric hospital were included in the present review.

Comparison with different groups of patients was not considered as relevant to the focus of the present review.

Outcomes were primarily defined as criminality and homelessness among discharged patients. Criminality was expressed as the number of people who ended up in prison at some point during the follow-up period and thus was concerned mainly with serious offences. Homelessness was identified via the number of people who were known to become homeless or using services for homelessness at some point during the follow-up period. The rate or number of suicides was additionally examined in the studies that met inclusion criteria.

In order to meet inclusion criteria, studies had to utilise a cohort design and to either follow-up or trace back the discharged patients. Studies based on data gathered from registers unless they contained individual patients' data were excluded. Individual case reports were excluded from final analysis, as they would introduce systematic bias. Best effort was made to obtain grey literature with possibly relevant data, no time restrains were applied, and studies published in English, German, French or Dutch were all included in the analysis.

Search strategy

Scientific databases were searched in two phases. The pilot phase took place in July 2013 and Pubmed/Medline was chosen for initial searching. 19 potentially eligible articles were identified and

8 of them examined homelessness and criminality among deinstitutionalized patients, 2 of which were concerned with the TAPS study population. These 19 articles were analyzed and relevant information extracted. Reference lists were searched for additional articles and so was the review published later that year by Kunitoh (56). The pilot demonstrated that a broad search strategy had to be utilized in order to identify all potentially eligible studies. For example, some studies did not refer to deinstitutionalization but rather to psychiatric or mental hospital closure, others used the term 'transinstitutionalization' or 'reinstitutionalization' in order to describe the process of how formerly institutionalized patients ended up in other institutions, including jails and prisons and institutions for homeless people. Some studies did not use any of the previously mentioned terms and spoke simply about patients discharged from psychiatric hospitals.

The second search phase took place in October, November and December 2013. The search strategy was developed, tested, adjusted and finally applied at Pubmed/Medline (up to November 2013 week 2) and Web of Knowledge (including Web of Science from 1900 and Medline from 1950, both up to November 2013 week 2), and subsequently also adjusted for databases working on Ovid platform including PsycINFO, Health Management Information Consortium (HMIC) and Social Policy and Practice (SPP) (all searched up to December 2013 week 2). Combination of trunctuated and asterixized words deinstitutionalization, crime, homelessness, psychiatry, reinstitutionalization, traninstitutionalization, psychiatric hospital, mental hospital, discharge and closing was used to identify possibly relevant studies in both, peer-reviewed journals as well as grey literature (see Appendix 3 for more details). Cochrane Library was searched simply using the ‚deinstitutionali?ation' for title, abstracts and keywords, last search was conducted in January 2014 week 5.

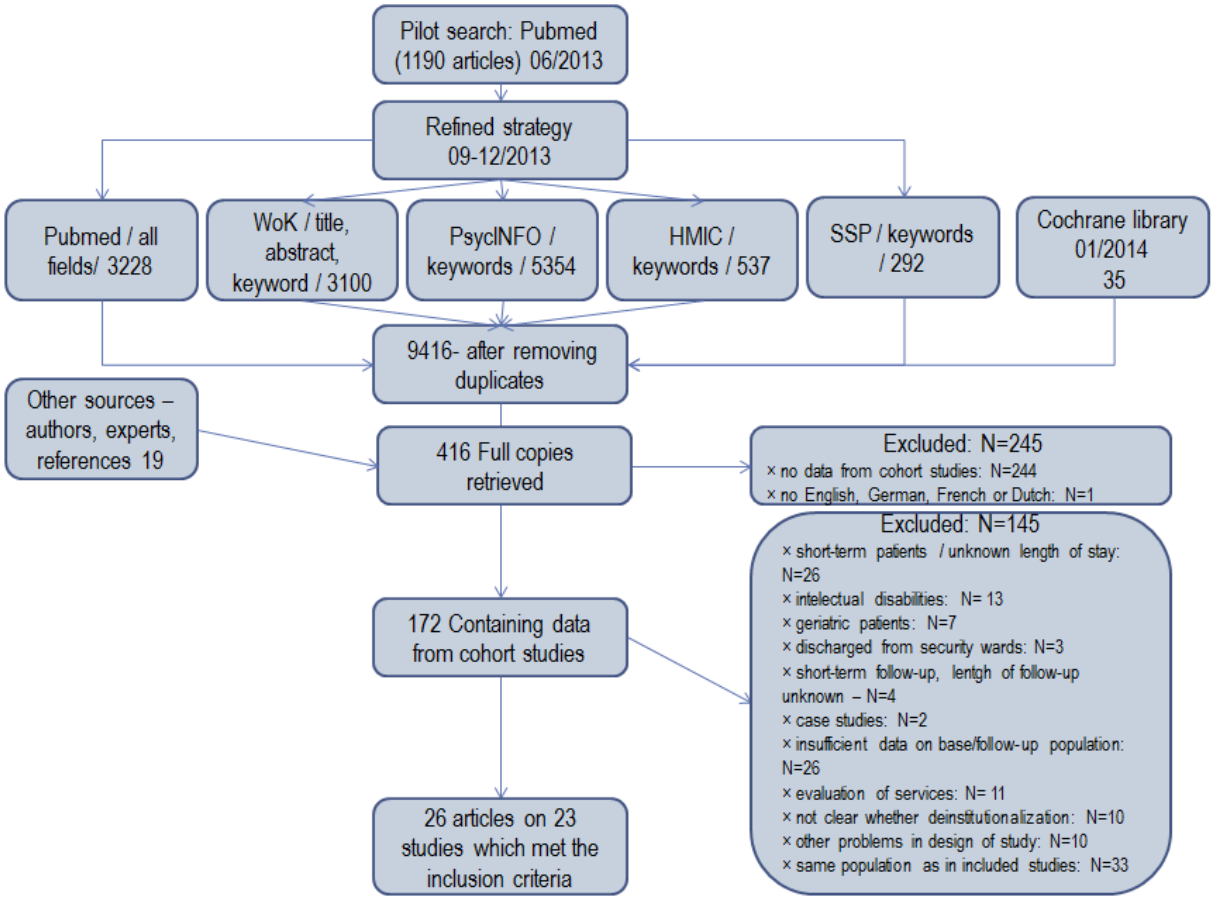
Role of the funding source

The funding source have had no role in neither of the following: study design, data collection and analysis, interpretation of the results, writing the report and decision to submit the paper for publication.

Results

The search strategy resulted in over 9,416 unique and possibly relevant pieces of literature. A large proportion of relevant articles were identified by this strategy, and the number of other potentially eligible articles identified via references, authors and experts is small (n=19). The full PRISMA flowchart is presented below.

PRISMA flowchart



Included studies

23 studies representing unique populations of deinstitutionalized patients from Albania, Australia, Austria, Canada, England, Wales, Finland, Ireland, Italy, Japan, Northern Ireland, Scotland and USA were identified and analysed. The studies included patients discharged between 1970 in Australia (59) and 2011 in Albania (60), which effectively means that the very first period of deinstitutionalization has not been covered [since this was in 19xxx ….]. The first study conducted in the USA and the UK including patients discharged between 1980 and 1986, and 1982 and 1984 respectively. No eligible studies from Latin America were found. The descriptions of studies that were included and excluded is detailed in appendixes. The included studies are summarised in Table 1.

The studies differed in quality and ranged from small local cohort studies where the number of respondents was as low as 14 (61) to large cohort studies conducted on a national scale, where the number of respondents was as high as 3,307 (62). The studies of highest quality were conducted by the TAPS team in England (52) and by Honkonen et al. in Finland (72). These studies were methodologically rigorous and included large cohorts of patients. However, there was a considerable loss to follow-up in the Finnish study (72). Both of these studies reported little adverse consequences and patients being more satisfied in the community than in the hospital.

The percentage of women included in studies ranged from 15 % (54) to 100 % (60), and the proportion of those with schizophrenia from 48 % (63) to 100 % (61, 62, 64). The mean age of discharged patients varied between 37.6 (65) and 67.3 (66) years. All discharged patients had a considerably long stay in psychiatric hospitals ranging from 8 (67, 68) to 37 years (69) and were followed up from 1 year (70) up to 14.1 years after discharge (71). The studies by Farragher *et al* (71), McInerney *et al* (54), and Furlan *et al* (69) had a high rate of loss to follow-up to due to high death rates (46.9 %, 33.3 % and 19.3 % respectively). The McGrew *et al* study (67) had a 21.8 % loss to follow-up due to rehospitalization of previously discharged patients. The rate of those who refused to participate in the follow-up was the highest in the studies by Honkonen *et al* (72) and Leff (52), where it reached 8.9 % and 3.1 % respectively. Otherwise, refusals to follow-up were quite rare. The rate of untraced patients was under 1 % in the majority of studies, but it reached 4.8 % in the study by Honkonen *et al* (62), 4.2 % in the study by Lesage *et al* (9) and 3.7 % in the study by Haberfellner *et al* (63). Loss to follow-up may be an important finding and this is discussed further below.

Out of 23 studies, 15 reported no case of homelessness among discharged patients. Barbato *et al* (73) reported 1 case out of 163 patients (0.6% rate), Leff (52) reported 7 cases out of 737 patients (0.9% rate), Mastroeni *et al* (74) reported 1 case out of 97 discharged patients (1% rate), Rothbard *et al* (75) reported 6 cases out of 321 patients (1.9% rate), Jones *et al* (55) reported 1 case out of 50 patients (2% rate). Honkonen *et al* (72), McGrew *et al* (67) and Lesage *et al* (9) reported 0-22, 0-4 and 0-7 possible cases of homelessness out of 3.307, 96 and 303 patients (0-0.7%, 0-4.2%, and 0-2.3% rate) respectively. Problems with housing other than homelessness were identified in some studies and are described in Appendix 1. Problems with defining homelessness are discussed later.

The number of deinstitutionalized patients that ended up in prison was available for 18 studies. Of these 11 reported that no patients ended up in rison. Donnelly *et al* (76) found 1 out of 321 patients in prison (0.3% rate), Leff (52) found 2 out of 737 patients in prison (0.3% rate), McInerney *et al* (54) found 1 out of 87 patients in prison (1.1% rate), McGrew *et al* (67) found 4 out of 303 patients in prison (1.3% rate), Barr and Parker (59) found 2 out of 140 patients in prison(1.4% rate), Okin *et al* (65) reported that 1 out of 64 patients was found imprisoned (1.6% rate) and Thornicroft *et al* (66) found that 3 out of 73 discharged patients ended up in prison (4.1% rate). Misdemeanours that had not led to imprisonment occurred semi-occasionally and these are characterized in appendix 1.

Suicides were reported in 18 studies, and of these, 11 indicated that no suicide occurred. The highest rates of suicides were reported by McInerney (77) who found that 3 out of 87 patients committed suicide (3.4% rate), Farragher *et al* (78) who found that 4 out of 226 patients committed suicide (1.8% rate), and Andrews *et al* (79) who found that 3 out of 208 discharged patients committed suicides (1.4% rate).Table 1 Summary of included studies

1st Author	Year of publ.	Country of disch.	Place of discharge	Year of disch.	N	Female %	Mean age	Schiz %	Mean length of stay	Mean length of follow up	Death in the time of FU	Refused the FU	Untraced	Other loss to FU	Homeless	In prison	Suicide	More satisfied in community
Barr	1975	Australia	Callan Park Hospital	1970-3	140	UN	53.3	70	13,2	1,7	11	0	2	15	0	2	UN	Yes
Jones	1986	England	York mental hospitals	1982-84	50	50	UN	>50	22	2	UN	UN	0	UN	1	0	0	UN
Andrews	1990	Australia	New South Wales hospitals	1984-87	208	29	UN	80	UN	1,9	13	3	1	19	0	0	3	Yes
MacGilp	1991	Scotland	Argyll and Bute Hospital	1981-89	48	42	57	54	14	4,6	8	1	0	14	0	0	UN	Yes

Okin	1995	USA	Rhode Island's State Hospital	1980-86	64	42	37.6	70	15,4	7,5	9	0	0	2	0	1	0	Yes
Farragher	1996	Ireland	Rehabilitation ward in rural Ireland	1974-89	226	50	51	62	11	14,1	106	0	0	0	0	0	4	UN
Donnelly	1996	N. Ireland	6 long-stay psychiatric hospitals in NI	1990-92	188	42	63	67	22	1	6	0	0	0	0	0	0	Yes
Donnelly	1997	N. Ireland	6 long-stay psychiatric hospitals in NI	1987-90	321	42	63	64	22	4,5	41	1	2	35[a]	0	1	3	Yes
Leff	1997	England	Claybury and Friern Hospitals, London	1985-93	737	UN	53.4	UN	23	1	24	23	7	12	7	2	0-2	Yes
Honkonen	1999	Finland	Hospitals all over the country	1986-90	3307	46	38.2	100	UN	3	121	293	159	0	0-22	UN	31	Yes
McGrew	1999	USA	Central State Hospital, Indiana	1994	303	33	43.9	63	8	2	27	0	7	66[b]	0-7	4	UN	Yes
Rothbard	1999	USA	Philadelphia State Hospital	1988-93	321	35	46	83	9,8	3	24	UN	UN	14	6	UN	0	UN
Lesage	2000	Canada	Louis-H Lafontaine hospital, Quebec	1989-98	96	53	UN	65	14,4	4,5	0	0	4	11[b]	0-4	0	UN	UN
Hobbs	2002	Australia	Psychiatric hospital in Sydney	1994-95	47	47	41	98	8	6	3	0	0	0	0	0	0	Yes
Barbato	2004	Italy	Antonini Mental Hospital, Milan area	1998-99	163	41	43.9	52	28,3	3,5	22	0	0	3	1	UN	0	UN
Haberfellner	2004	Austria	Landesnervenklinik Wagner Jauregg, Linz	1995-00	163	44	57,8	48	19,3	3,6	28	5	6	8	0	0	UN	UN
Mastroeni	2005	Italy	Como Mental Hospital, Northern Italy	1999	97	44	57.4	74	17,4	5	14	0	0	2	1	0	0	UN
Thornicroft	2005	England	Cane Hill Hospital, London	1990ies	73	51	67.3	92	36,5	1	13	0	0	0	0	3	0	Yes
Mizuno	2005	Japan	Sasagawa Hospital	2002	78	35	54.6	100	26	1	2	0	0	0	0	0	1	UN
Chan	2007	Japan	Tosa Hospital, Japan	aft. 2000	14	29	63	100	24,2	2	UN	UN	0	UN	0	UN	0	Yes
Furlan	2009	Italy	Collegno and Grugliasco hospitals, Turin area	1998-02	176	38	63	73	37	4	34	0	0	24[c]	0	UN	0	UN
Carta	2013	Albania	Vlore psychiatric hospital, Albania	2010-11	16	100	42.6	56	12,3	1	0	0	0	0	0	0	0	UN
McInerney	2014	Ireland	Our Ladie's Hospital, Ennis	2000-01	87	15	57.5	75	12	10	29[d]	UN	2	0	0	1[e]	3	Yes

[a)] 33 of those were in hospital, and thus ineligible for the follow-up.

[b)] Patients were hospitalized in the time of follow-up.

[c)] Patients were transferred to facilities for the elderly.

[d)] At the 5-year follow-up

[e)] At the five-year follow-up, this man committed suicide later on.

Discussion

Context matters

Deinstitutionalization has been criticized, mainly in the USA, where it was considered to have been poorly organised, resulting in lower levels of funding or budget cuts, and to also have been inconsistent with stated political declarations (39, 80-91). This has been concisely described by Dumont and Dumont (92) who states that original US plan, developed under the presidency of J. F. Kennedy and L. B. Johnson, included an investment of $ 7 billion and establishment of 2000 Community Mental Health Centres across US, however, this plan was not realised as Kennedy's successor, R. Nixon, substantially restricted its funding. The appropriateness of the delivery of community care has also been criticized elsewhere, for example in Canada (93), and Denmark (17).

Ecological studies have been widely used to research the various consequences of deinstitutionalization. These studies often conclude that decreasing the number of beds in mental hospitals leads to increasing number of people with mental illnesses in prisons and/or on the streets. The systematic literature review reported here, however, does not support this and we think that these ecological studies might have been confounded. Rather than deinstitutionalization, other societal factors such as rapid globalization, increases in migration, growing individualism, less emphasis on traditional families, pressure on housing and labour market, increased illegal drug use, growing unemployment, legal changes (e.g. those associated with war on drugs), changes in mental health care funding and associated budget cuts could have all contributed to the rising number of those with mental health problems who end up in prisons or become homeless in the USA and in Western Europe. Durham (91) emphasised that the context of deinstitutionalization in the USA was characterized by restrictive changes in Medicaid, Social Security and disability payment systems, and by the reduction in low cost housing and other socio-political changes.

Countries of Latin America have also undergone deep societal changes in the last 30 years. While the overall burden of psychiatric and neurological diseases has grown tremendously, investment in mental health care has remained very low, and other societal challenges emerged (94). Again, in this context, it might be not surprising that the study by Mundt *et al* (8) which analyzed data related to deinstitutionalization in Latin America found an association between a decreasing number of mental health beds and an increasing number of prison places. The authors were, however, aware of its limitations, and indicated that an increase in the number of prison places cannot be solely explained by decreases in the number of hospital beds. They suggest that more evidence is required to determine the pathways leading people with mental health problems into prison (8).

The evidence presented here comes from cohort studies of long-term psychiatric patients discharged into the community. These studies might be more helpful than ecological studies in determining direct causality between deinstitutionalization and homelessness and criminality (95). The present systematic literature review shows that such studies were conducted on different cohorts of patients and are available from Australia, England and Wales, USA, Italy, Ireland, Northern Ireland, Japan, Albania, Austria, Canada, Finland, and Scotland. Analysis of these studies demonstrates that homelessness and/or criminality among discharged patients occurred sporadically.

The findings suggest that even those patients who were discharged after many years of hospitalization did well in the community. This is in line with the evidence presented by Kunitoh (56)

who conducted a systematic review and concluded that deinstitutionalization has been generally beneficial for the majority of discharged patients in terms of both, social functioning and quality of life. It also supports findings made by Rothbard and Kuno (96) who analyzed four cases of deinstitutionalization in Europe and suggested that discharging long-stay patients to communities might be easier than it is usually assumed. This paper reveals that there is very little evidence of negative consequences of deinstitutionalization globally.

Limitations

Patients from the studies analyzed here are not representative of all deinstitutionalized patients. Untraced and unreported patients could bias the results, although it would be far from appropriate to conclude that untraced patients were either in prison or homeless. Analysis of dropouts, which were conducted in some studies, for example those by Gardos *et al* (97) and Honkonen *et al* (62), showed that these patients did better at baseline, and therefore might have had health improvements during the follow-up and as a consequence deliberately lost contact with mental health services. In addition, there might have been some unreported negative outcomes in primary studies, for instance those that occurred among patients who were already dead by the time of the follow-up. Differences in length of stay, age, gender distribution, place and means of discharge, availability of community services and year of discharge were detected in included studies and make direct comparisons more difficult. Furthermore, mean values might be unrepresentative because outliers could skew the distribution. This was probably the case for many studies included in the final analysis here, but this influenced only the socio-demographics of patients and not the outcomes of interest (homelessness, imprisonment, suicidality), as these have a binary form (yes or no).

There were considerable differences in the follow-up periods, which ranged from one to 25 years. Studies with longer follow-up are expected to have larger drop-out rates and also a higher chance that some of the respondents became homeless, committed a serious offence or committed suicide. Differences in the health status and history of psychiatric treatment of the population in the studies may be attributed to differences in diagnostic profiles. In some cases, for example in the study by Furlan *et al* (69), the mean age of patients was close to 65 years, which indicates that there could be some patients with age related disorders such as dementia, which could slightly bias the results. In many studies there were some patients with personality and drug use related disorders, and it is not entirely clear whether these were the patients who eventually became homeless or imprisoned.

A further limitation is related to the place of stay after discharge from hospital. Some of the patients were discharged to nursing homes, and it is questionable whether these can be considered to be proper community facilities. The same applies to the Sasagawa project (64). The Sasagawa hospital was rebuilt into the facility with traditional flats and it is arguable whether this represents ‘regular’ deinstitutionalization. Additionally, the definition of homelessness was not addressed in the majority of studies. For instance, in the study of Rothbard *et al* (75) everyone who had experienced an admission to a homeless shelter was considered as a homeless person, no matter how long this period had lasted. On the other hand, Double and Wong (98) found two former patients in a Sheffield hostel for homeless men, but did not consider those two to be homeless. The problem of definition also applies to criminality. There are a number of ways to measure criminality including self-reports, police reports, number of trials, records from country specific registers etc. The present review focused on serious offences only and reported the number of those who ended up in prison

after being discharged from psychiatric hospitals. Less serious offences, as well as other relevant details from primary studies, are reported in appendices.

New cohorts and short-term patients

Despite the limitations, this systematic review suggests that deinstitutionalization has not resulted in substantial homelessness and imprisonment among discharged long-term patients. It may be, however, hypothesized that deinstitutionalization had a negative effect on new cohorts of patients who did not have access to psychiatric hospitals. This hypothesis is difficult to test. A recent randomized controlled trial and five-year follow up of newly admitted patients with schizophrenia spectrum disorder in Denmark did not find evidence to justify hospital-based treatment (99) and a study by Wahlbeck (100) suggested that deinstitutionalization in Nordic countries, where appropriate community services were available, might have contributed to a reduction in the life expectancy gap between those with mental health problems and general population, but still it is difficult to entirely rule out the aforementioned hypothesis.

It may be also argued that long-term hospital patients are stabilized and thus at a lower risk of unwanted outcomes than those in a first year of severe mental illness. This argument, however, is not against deinstitutionalization. It stresses the need for availability of mental health services and mental health beds, but does not imply that these have to be located in large psychiatric institutions. Vice versa, Housing First and Assertive Community Treatment are both community based services that have been shown to be effective in working with homeless people with mental health problems (101-103). Although it might be more expensive to provide such a comprehensive care in the community, this does not make it less cost-effective and it is a human right to live independently and to be included in the community (104).

Implications

The perfect methodological approach that would allow a clear conclusion on the association between deinstitutionalization and homelessness and imprisonment is unclear. This systematic literature review, however, demonstrates that the number of former long-stay patients who became homeless or imprisoned after being deinstitutionalized was not excessive, which is contrary to popular arguments that have been widely published since the 1960s. The findings suggest that some of the ecological studies may have been confounded. Cohort studies that followed-up or traced-back discharged long-term psychiatric patients shows that patients benefited from the transfer to the community and that serious behavioural problems such as homelessness, imprisonment or/and suicides did not occur frequently. This might have been, however, different with patients who suffered from intellectual disabilities or those who were discharged from secure wards.

The review has implications for forthcoming psychiatric reforms in Eastern Europe and elsewhere. It will help decision makers to tackle the argument that deinstitutionalization will lead to homelessness and criminality among those with mental health problems, and it will also help stakeholders to justify reforms and advocate increase for investments in mental health budgets.

The findings presented here also suggests that Penrose's hydraulic hypothesis might need to be reconsidered. In the time of Penrose, de facto all public mental health care investments went into psychiatric hospitals. Decreasing the number of psychiatric beds signified decreasing investments into mental health care. This has, however, changed with the discovery of effective psycho-

pharmaceuticals and with the introduction of new forms of care which both emerged roughly in the mid-20th Century. Now, a decrease in the number of psychiatric beds no longer necessarily means a decreasing investment into mental health care. Vice versa, as a consequence of increasing burden of mental disorders and more pressure on the availability of good-quality care in the community, investments into mental health might be rising, but the number of beds in mental hospitals may be simultaneously decreasing. Deinstitutionalization has been criticized and its association with homelessness and criminality among those with mental disorders has been suggested mainly in locations where there have also been deep societal changes, mental health budget cuts, and insufficient investment into the development of appropriate multi-layered care in the community. Together these factors might suggest that Penrose's hydraulic hypotheses could be stated more precisely as the idea that criminality and homelessness increases as efficacious public investments into mental health decreases. Further research would be, however, needed in order to examine Penrose's refined hypothesis.

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Authors contribution

Petr Winkler came up with the idea, piloted and conducted literature search, analyzed articles in English, and wrote a substantial part of the article. Barbara Barrett and Paul McCrone supervised work methodologically at all stages and contributed to the final version of the article. Ladislav Csémy contributed methodologically, especially in early phase of the review, and he also analyzed articles in French and Dutch. Miroslava Janoušková analyzed articles in German. Cyril Höschl contributed methodologically, especially in early phase of the review, and suggested to analyze frequency of suicides in included cohort studies. All authors critically revised previous versions of the article and suggested changes for improvements. All authors gave their final approval to publish the submitted version of the article, and accepted their accountability for the work.

Declaration of interest

Petr Winkler has no conflict of interest.

Barbara Barrett has no conflict of interest

Paul McCrone has no conflict of interest

Ladislav Csémy has no conflict of interest.

Miroslava Janoušková has no conflict of interest.

Cyril Höschl has no conflict of interest.

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